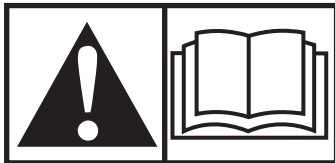




POWERSMART SERIES™ INVERTER GENERATOR
SERVICE AND REPAIR MANUAL
MODEL 030473



This generator is rated in accordance with CSA (Canadian Standards Association) standard C22.2
No. 100-04 (motors and generators)

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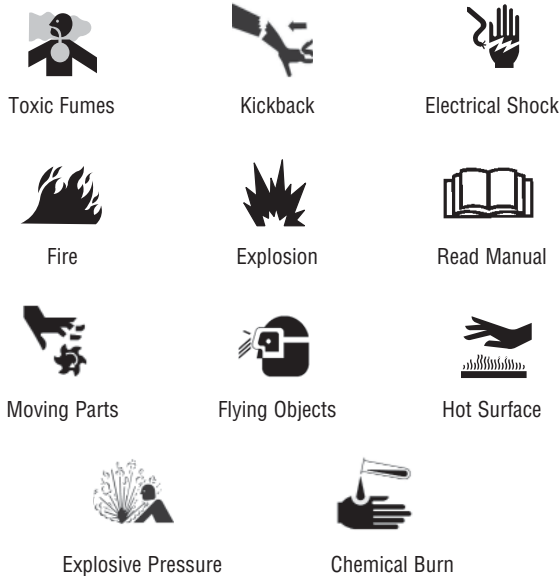
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Important Safety Instructions

SAVE THESE INSTRUCTIONS - This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries.

Safety Symbols and Meanings



▲ The safety alert symbol indicates a potential personal injury hazard. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to designate a degree or level of hazard seriousness. A safety symbol may be used to represent the type of hazard. The signal word NOTICE is used to address practices not related to personal injury.

▲ **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury.

▲ **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury.

▲ **CAUTION** indicates a hazard which, if not avoided, *could* result in minor or moderate injury.

NOTICE addresses practices not related to personal injury.

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and the tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique that the manufacturer does not specifically recommend, you must satisfy yourself that it is safe for you and others. You must also make sure that the procedure, work method or operating technique that you choose does not render the generator system unsafe.

▲ DANGER

Using a generator indoors CAN KILL YOU IN MINUTES.

Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.

NEVER use inside a home or garage, **EVEN IF** doors and windows are open.

Only use OUTSIDE and far away from windows, doors, and vents.

▲ WARNING Running engine gives off carbon monoxide, an odorless, colorless, poison gas. Breathing carbon monoxide could result in death, serious injury, headache, fatigue, dizziness, vomiting, confusion, seizures, nausea or fainting.

- Operate this product **ONLY** outdoors.
- Install a battery operated carbon monoxide alarm near the bedrooms.
- Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings.

▲ WARNING The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.


▲ WARNING Certain components in this product and related accessories contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after handling.*

▲ WARNING

- This generator does not meet U.S. Coast Guard Regulation 33CFR-183 and should not be used on marine applications.
- Failure to use the appropriate U.S. Coast Guard approved generator could result in death or serious injury and/or property damage.

▲ WARNING Starter cord kickback (rapid retraction) will pull hand and arm toward engine faster than you can let go which could cause broken bones, fractures, bruises, or sprains resulting in serious injury.

- When starting engine, pull cord slowly until resistance is felt and then pull rapidly to avoid kickback.
- Never start or stop engine with electrical devices plugged in and turned on.

 **WARNING** Fuel and its vapors are extremely flammable and explosive which could cause burns, fire, or explosion resulting in death, serious injury, and/or property damage.

When Adding or Draining Fuel

- Turn generator engine OFF and let it cool at least 2 minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
- Fill or drain tank outdoors.
- DO NOT overfill tank. Allow space for fuel expansion.
- If fuel spills, wait until it evaporates before starting engine.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- DO NOT light a cigarette or smoke.

When Starting Equipment

- Ensure spark plug, muffler, fuel cap, and air cleaner are in place.
- DO NOT crank engine with spark plug removed.

When Operating Equipment


- DO NOT operate this product inside any building, carport, porch, mobile equipment, marine applications, or enclosure.
- DO NOT tip engine or equipment at angle which causes fuel to spill.
- DO NOT stop engine by moving choke to "CHOKE" position.

When Transporting, Moving, or Repairing Equipment


- Transport/move/repair with fuel tank EMPTY or with fuel shutoff valve OFF.
- DO NOT tip engine or equipment at angle which causes fuel to spill.
- Disconnect spark plug wire.

When Storing Fuel or Equipment with Fuel in Tank


- Store away from furnaces, stoves, water heaters, clothes dryers, or other appliances that have pilot light or other ignition source because they could ignite fuel vapors.

 **WARNING** Generator voltage could cause electrical shock or burn resulting in death or serious injury. Use approved transfer equipment to prevent backfeed by isolating generator from electric utility workers.

- When using generator for backup power, notify utility company.
- Use a ground fault circuit interrupter (GFCI) in any damp or highly conductive area, such as metal decking or steel work.
- DO NOT touch bare wires or bare receptacles.
- DO NOT use generator with electrical cords which are worn, frayed, bare or otherwise damaged.
- DO NOT operate the generator in the rain or wet weather.
- DO NOT handle generator or electrical cords while standing in water, while barefoot, or while hands and feet are wet.
- DO NOT allow unqualified persons or children to operate or service generator.

 **WARNING** Exhaust heat/gases could ignite combustibles or structures resulting in death, serious injury and/or property damage. Contact with muffler area could cause burns resulting in serious injury.

- DO NOT touch hot parts and AVOID hot exhaust gases.
- Allow equipment to cool before touching.
- DO NOT install the generator closer than 5 feet (1.5m) from any combustibles or structures with combustible walls having a fire resistance rating of less than 1 hour.
- Keep at least minimum distances shown in *General Location Guidelines* to insure for proper generator cooling and maintenance clearances.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.
- Replacement parts must be the same and installed in the same position as the original parts.


 **WARNING** Unintentional sparking could cause fire or electric shock resulting in death or serious injury.

When Adjusting Or Making Repairs To Your Generator


- Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.

When Testing For Engine Spark

- Use approved spark plug tester
- DO NOT check for spark with spark plug removed.

 **WARNING** Starter and other rotating parts could entangle hands, hair, clothing, or accessories resulting in serious injury.

- NEVER operate generator without protective housing or covers.
- DO NOT wear loose clothing, jewelry or anything that could get caught in the starter or other rotating parts.
- Tie up long hair and remove jewelry.

 **CAUTION** Excessively high operating speeds could result in minor injury and/or equipment damage. Excessively low speeds impose a heavy load on generator.

- DO NOT tamper with governed speed. Generator supplies correct rated frequency and voltage when running at governed speed.
- DO NOT modify generator in any way.

NOTICE Exceeding generator's wattage/amperage capacity could damage generator and/or electrical devices connected to it.

- DO NOT exceed the generator's wattage/amperage capacity. See Don't Overload Generator in the Operator's Manual.
- Start generator and let engine stabilize before connecting electrical loads.
- Connect electrical loads in OFF position, then turn ON for operation.
- Turn electrical loads OFF and disconnect from generator before stopping generator.

NOTICE Improper treatment of generator could damage it and shorten its life.

- Use generator only for intended uses.
- If you have questions about intended use, contact your authorized dealer.
- Operate generator only on level surfaces.
- DO NOT expose generator to excessive moisture, dust, dirt, or corrosive vapors.
- Remain alert at all times while working on this equipment. Never work on the equipment when you are physically or mentally fatigued.
- DO NOT start engine with air cleaner or air cleaner cover removed.
- DO NOT insert any objects through cooling slots.
- DO NOT use the generator or any of its parts as a step. Stepping on the unit could cause stress and break parts. This may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.
- If connected devices overheat, turn them off and disconnect them from generator.
- Shut off generator if
 - electrical output is lost;
 - equipment sparks, smokes, or emits flames;
 - unit vibrates excessively.

Generator Location

▲ WARNING Exhaust heat/gases could ignite combustibles or structures resulting in death, serious injury and/or property damage.



- Keep at least 5 feet (152 cm) of clearance on all sides of generator including overhead.

For proper clearance and air movement, place generator outdoors in an area that will not accumulate deadly exhaust gas. DO NOT place generator where exhaust gas (A, Figure 1) could accumulate and enter inside or be drawn into a potentially occupied building. Ensure exhaust gas is kept away from any windows, doors, ventilation intakes, or other openings that can allow exhaust gas to collect in a confined area. Prevailing winds and air currents should be taken into consideration when positioning generator.

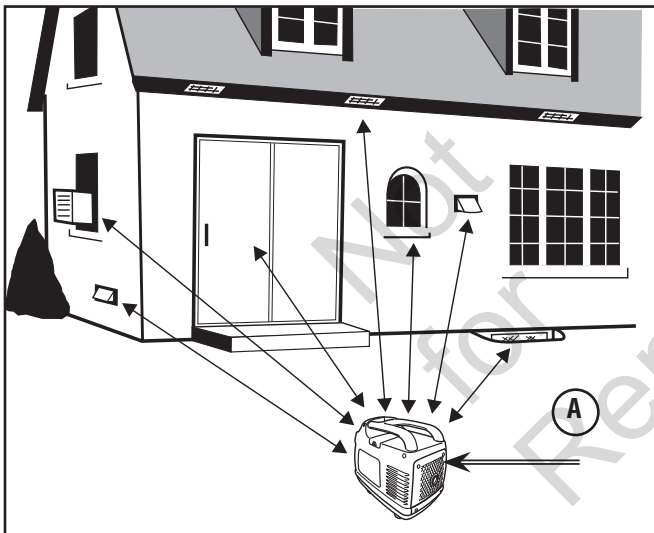


Figure 1

Fuel Recommendations

Fuel must meet these requirements:

- Clean, fresh, unleaded gasoline
- A minimum of 87 octane/87 AKI (91 RON)
- Gasoline with up to 10% ethanol (gasohol) or up to 15% MTBE (methyl tertiary butyl ether) is acceptable.

NOTICE: Do not use unapproved gasoline, such as E85.

Do not mix oil in gasoline or modify the engine to run on alternate fuels. Failure to follow will result in damage to the engine and/or generator and will void the warranty.

To protect the fuel system from gum formation, mix in a fuel stabilizer when adding fuel. All fuel is not the same. If you experience starting or performance problems after using fuel, switch to a different fuel provider or change brands. This engine is certified to operate on gasoline. The emission control system for this engine is EM (Engine Modifications).

▲ WARNING Fuel and its vapors are extremely flammable and explosive which could cause burns, fire, or explosion resulting in death, serious injury, and/or property damage.



When Adding or Draining Fuel

- Turn generator engine OFF and let it cool at least 2 minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
- Fill or drain tank outdoors.
- DO NOT overfill tank. Allow space for fuel expansion.
- If fuel spills, wait until it evaporates before starting engine.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- DO NOT light a cigarette or smoke.

High Altitude

At altitudes over 5,000 feet (1524 meters), a minimum 85 octane / 85 AKI (89 RON) gasoline is acceptable. To remain emissions compliant, high altitude adjustment is required. Operation without this adjustment will cause decreased performance, increased fuel consumption, and increased emissions.

Operation of the generator at altitudes below 2,500 feet (762 meters) with the high altitude kit is not recommended.

Fuel Tank Cap Vent Lever

The fuel tank cap is provided with a vent lever (A, Figure 2) to seal the fuel tank. The vent lever must be in the “ON” position for the engine to run.

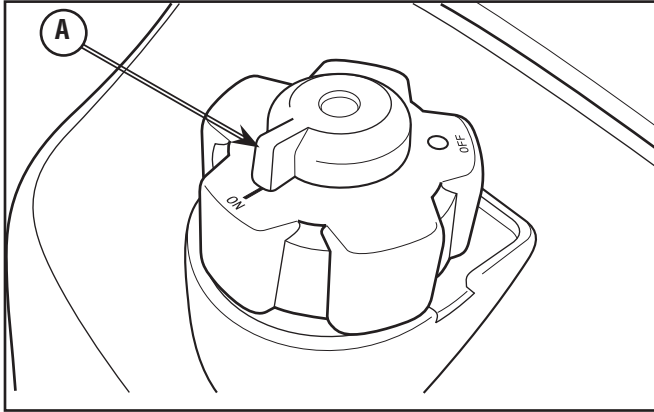


Figure 2

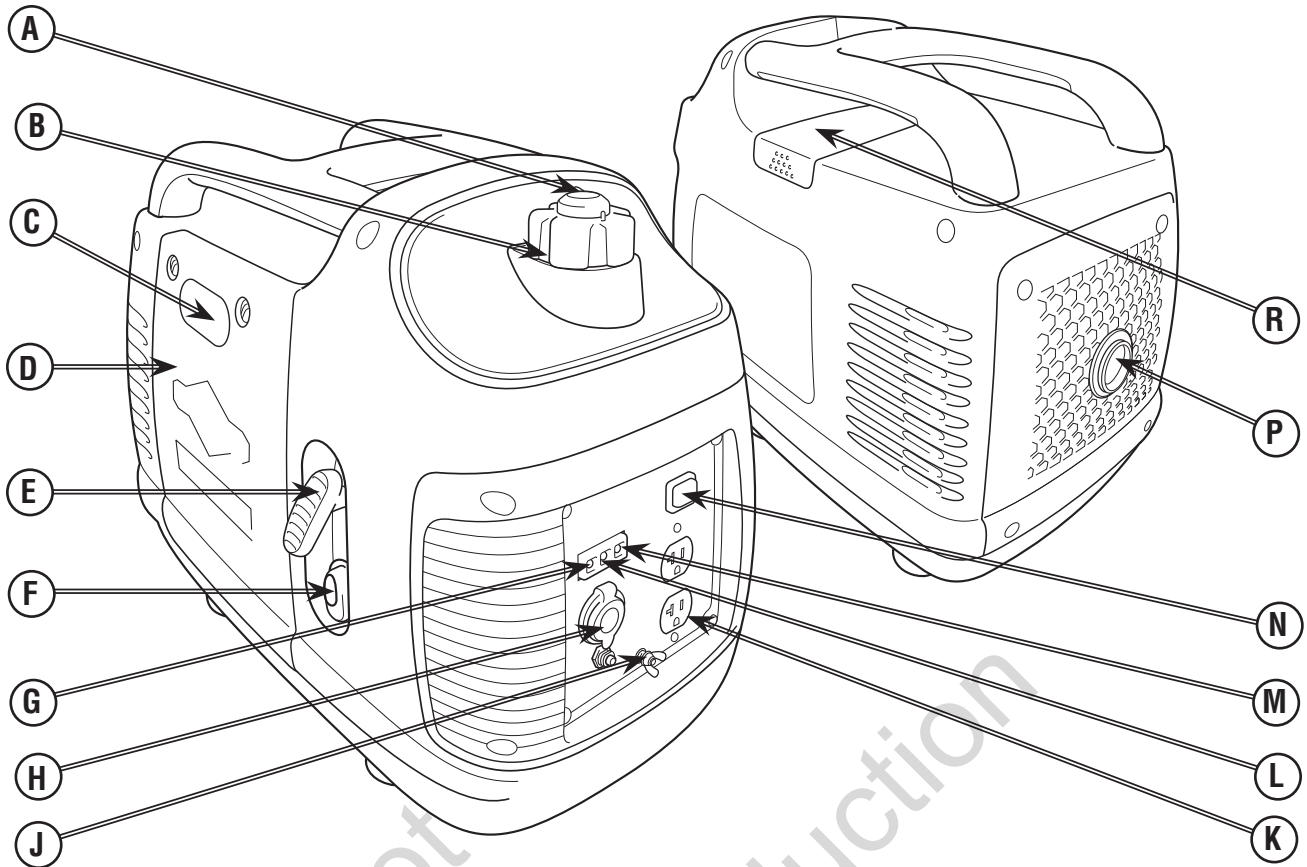
When the engine is not in use, leave the vent lever in the “OFF” position to reduce the possibility of fuel leakage. Allow the engine to cool before turning the vent lever to the “OFF” position.

Grounding Fastener

The generator neutral is floating, which means that the AC stator winding is isolated from the grounding fastener and the AC receptacle ground pins. Therefore, the AC receptacle ground pins are not functional and electrical devices, such as a GFCI will not operate.

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Generator Components



A - Fuel Tank Cap Vent Lever — Turn the vent lever to the “ON” position when operating the generator. Turn to the “OFF” position when not in use.

B - Fuel Tank — Capacity of 1.0 U.S. gallon (3.7L).

C - Choke Lever — Used when starting cold engine.

D - Side Maintenance Cover — Remove to gain access for air cleaner and oil service.

E - Recoil Starter — Used to start the engine manually.

F - Engine Switch — Set this switch to “ON” before using recoil starter. Set switch to “OFF” to stop engine. Also turns fuel valve on and off.

G - Output Indicator — A green LED light comes on when the generator is working correctly and producing power at the receptacles.

H - 12 Volt DC Receptacle — Use this receptacle with battery charge cables to charge a 12 Volt battery. This receptacle is protected by a push to reset circuit breaker.

J - Grounding Fastener — Consult your local agency having jurisdiction for grounding requirements in your area.

K - 120 Volt AC, 20 Amp, Duplex Receptacle — May be used to supply electrical power for the operation of 120 Volt AC, 20 Amp, single phase, 60 Hz electrical, lighting, appliance, tool, and motor loads.

L - Overload Alarm — A red LED light comes on and cuts power to the receptacles when the generator is overloaded.

M - Low Oil Indicator — A yellow LED light comes on when the oil in the generator drops below a preset level.

N - POWERSMART Switch — Use the switch to turn the POWERSMART mode on and off.

P - Spark Arrester Screen — Exhaust muffler lowers engine noise and is equipped with a spark arrester screen.

R - Top Maintenance Cover — Remove to gain access to the spark plug.

Items Not Shown:

Air Cleaner (behind side maintenance cover) — Protects engine by filtering dust and debris out of intake air.

Oil Fill Cap (behind side maintenance cover) — Check and add engine oil here.

Identification Label — Provides model, revision, and serial number of generator. Please have these readily available when calling for assistance.

Maintenance

Maintenance Schedule

Follow the hourly or calendar interval, whichever occurs first. More frequent service is required when operating in adverse conditions noted below.

Every 8 Hours or Daily
• Clean debris
• Check engine oil level
First 10 Hours
• Change engine oil
Every 50 Hours or 3 Months
• Service engine air cleaner and breather filter*
Every 100 Hours or 6 Months
• Clean fuel strainer
• Change engine oil*
• Service spark plug
• Inspect muffler and spark arrester
Every 250 Hours or Annually
• Check valve clearance

*Service more often under dirty or dusty conditions

General Recommendations

Regular maintenance will improve the performance and extend the life of the generator.

NOTICE: Improper treatment of the generator could damage it and shorten its life. Never operate generator without protective housing or covers to assure proper cooling. Some adjustments will need to be made periodically to properly maintain the generator.

Generator Maintenance

Generator maintenance consists of keeping the unit clean and dry. Operate and store the unit in a clean and dry environment where it will not be exposed to excessive dust, dirt, moisture, or any corrosive vapors. Cooling air slots in the generator must not become clogged with snow, leaves, or any other foreign material.

NOTICE: DO NOT use water or other liquids to clean generator. Liquids can enter engine fuel system, causing poor performance and/or failure to occur. In addition, if liquid enters generator through cooling air slots, some of the liquid will be retained in voids and cracks of the rotor and stator winding insulation. Liquid and dirt buildup on the generator internal windings will eventually decrease the insulation resistance of these windings.

Cleaning Fuel Strainer

The fuel strainer helps prevent debris from entering the fuel system.

Clean the fuel strainer as follows:

1. Make sure generator is on a level surface.
2. Remove the fuel cap (A, Figure 3) and fuel strainer (B).
3. Wash fuel strainer in liquid detergent and water.
4. Wipe fuel strainer clean with a clean, dry cloth.
5. Carefully reinstall the fuel strainer and fuel cap.

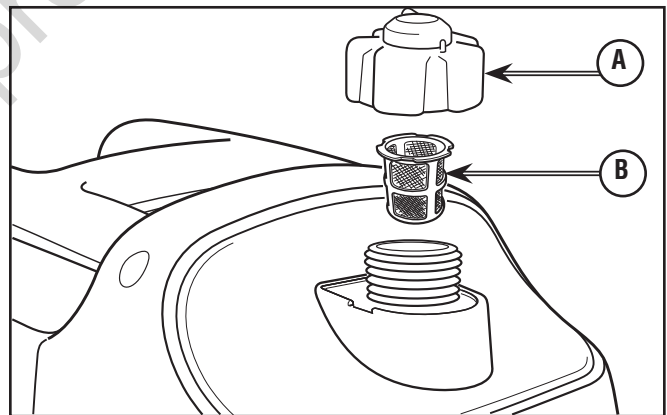


Figure 3

Engine Maintenance

⚠ WARNING Unintentional sparking could cause fire or electric shock resulting in death or serious injury.



When Adjusting Or Making Repairs To The Generator

- Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.

When Testing For Engine Spark

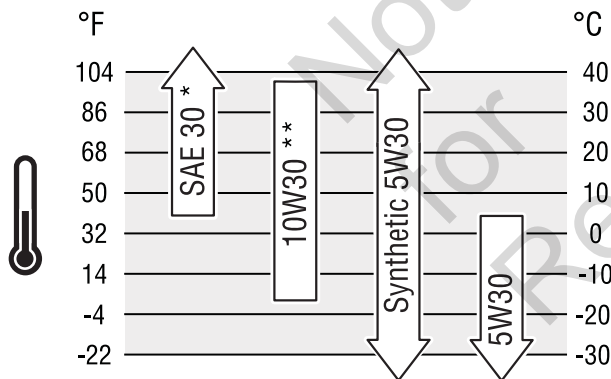
- Use approved spark plug tester
- DO NOT check for spark with spark plug removed.

Oil

Oil Recommendations

We recommend the use of Briggs & Stratton Warranty Certified oils for best performance. Other high-quality detergent oils are acceptable if classified for service SF, SG, SH, SJ or higher. DO NOT use special additives.

Outdoor temperatures determine the proper oil viscosity for the engine. Use the chart to select the best viscosity for the outdoor temperature range expected.



* Below 40°F (4°C) the use of SAE 30 will result in hard starting.

** Above 80°F (27°C) the use of 10W30 may cause increased oil consumption. Check oil level more frequently.

Checking Oil Level / Adding Oil

Oil level should be checked prior to each use or at least every 8 hours of operation. Keep oil level maintained.

1. Make sure generator is on a level surface.
2. Loosen the side maintenance cover screws and remove the side maintenance cover (Figure 4).

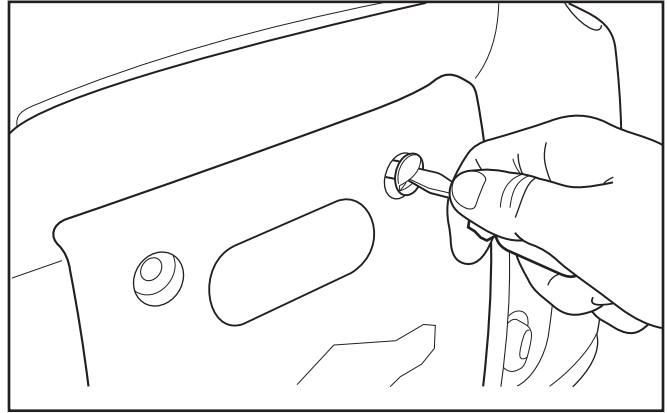


Figure 4

3. Clean area around oil fill and remove oil fill cap.
4. Verify oil is at the point of overflowing at oil fill opening (Figure 5).

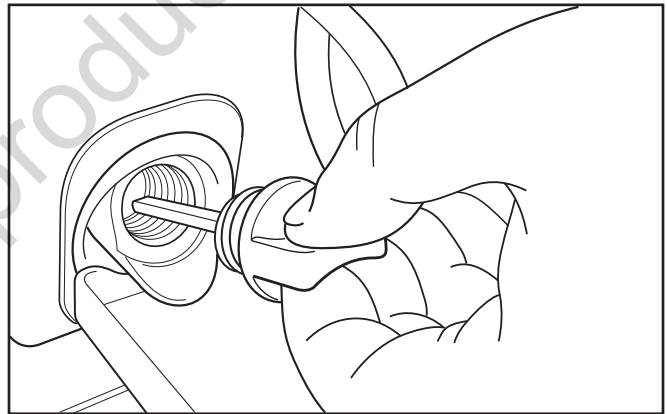


Figure 5

5. If needed, slowly pour oil into oil fill opening to the point of overflowing at oil fill.
6. Replace and tighten oil fill cap.
7. Reinstall the side maintenance cover and hand tighten the cover screws.

Changing Engine Oil

If the generator is used under extremely dirty or dusty conditions, or in extremely hot weather, change the oil more often.

- ⚠ CAUTION** Avoid prolonged or repeated skin contact with used motor oil.
- Used motor oil has been shown to cause skin cancer in certain laboratory animals.
 - Thoroughly wash exposed areas with soap and water.



KEEP OUT OF REACH OF CHILDREN. DON'T POLLUTE. CONSERVE RESOURCES. RETURN USED OIL TO COLLECTION CENTERS.

Change the oil while the engine is still warm from running, as follows:

1. Make sure generator is on level surface.
2. Loosen the side maintenance cover screws and remove the side maintenance cover.
3. Clean area around oil fill and remove oil fill cap.
4. Tip the generator to drain oil from oil fill into a suitable container, making sure that the unit is tipped towards the oil filler neck. When the crankcase is empty, return the generator to the upright position.
5. Slowly pour oil (about 13.5 oz.) into oil fill opening to the point of overflowing at oil fill cap. **DO NOT** overfill (Figure 6).

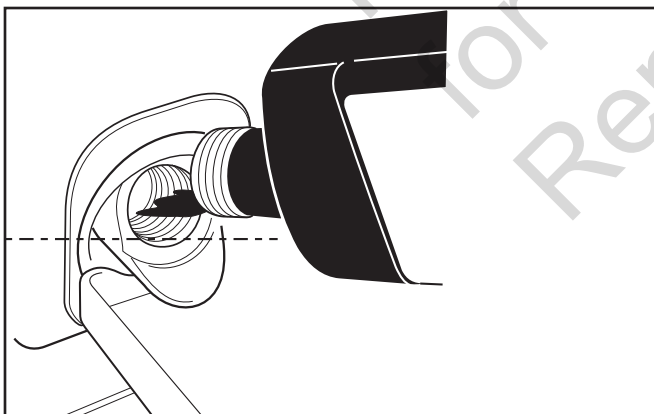


Figure 6

6. Reinstall oil fill cap. Finger tighten cap securely.
7. Wipe up any spilled oil.
8. Reinstall the side maintenance cover and hand tighten the cover screws.

Service Air Cleaner

The engine will not run properly and may be damaged if it is run with a dirty air cleaner. Service more often if operating under dirty or dusty conditions.

1. Loosen the side maintenance cover screws and remove the side maintenance cover.
2. Loosen air cleaner cover screw (A, Figure 7) and remove air cleaner cover (B).
3. Carefully remove foam air cleaner (C).
4. Carefully remove breather filter (D).

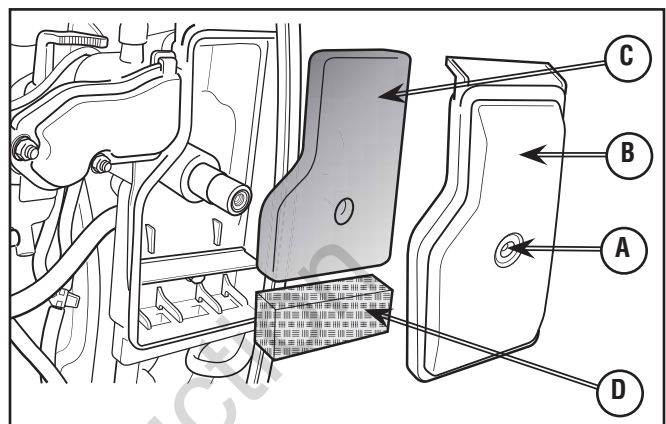


Figure 7

5. Wash foam air cleaner and breather filter in liquid detergent and water only. Squeeze dry in a clean cloth.
6. SATURATE foam air cleaner in clean engine oil and squeeze in a clean cloth to remove excess oil.
7. Reinstall clean or new foam air cleaner inside base.
8. Reinstall clean or new breather filter inside base.
9. Reinstall the air cleaner cover and tighten screw.
10. Reinstall the side maintenance cover and hand tighten the cover screws.

Service Spark Plug

1. Loosen the four handle screws and remove the handle (Figure 8).

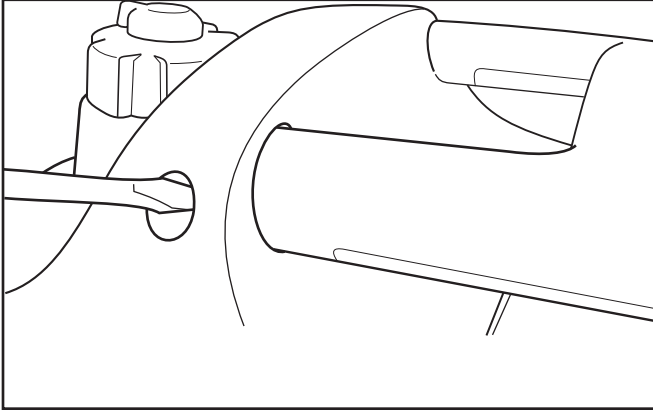


Figure 8

2. Remove the top maintenance cover.
3. Clean area around spark plug and remove spark plug boot (Figure 9).

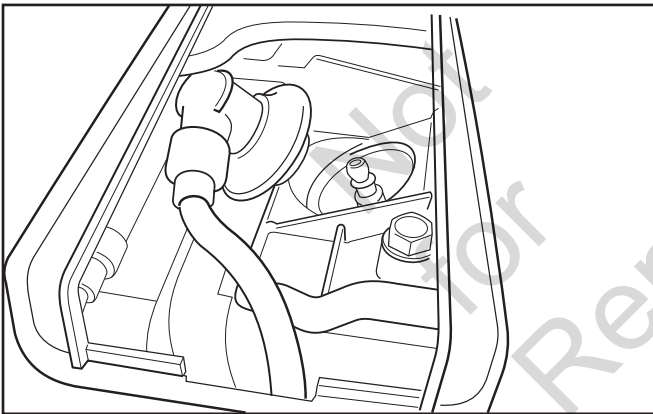


Figure 9

4. Remove spark plug and inspect for pitting, corrosion, cracks, or other signs of damage.
5. Check electrode gap with wire feeler gauge (A, Figure 10) and reset the spark plug gap to recommended gap if necessary.

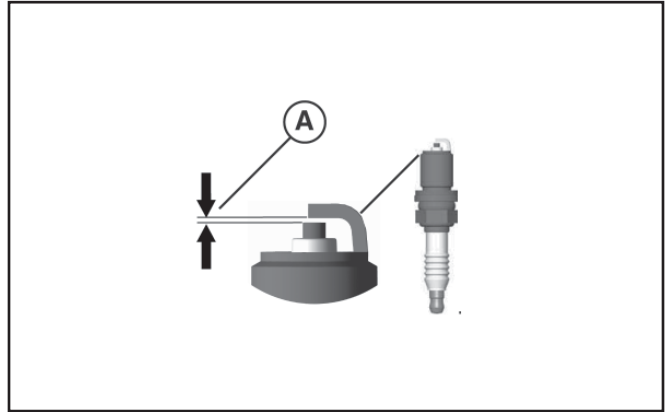


Figure 10

6. Replace spark plug if electrodes are pitted, burned, or porcelain is cracked. Use the recommended replacement plug.
7. Install spark plug and torque to 180 in. lbs. (20 Nm). Reinstall spark plug boot.
8. Reinstall top maintenance cover.
9. Reinstall handle and tighten the four handle screws.

Inspect Muffler and Spark Arrester

Inspect the muffler for cracks, corrosion, or other damage. Remove the spark arrester, if equipped, and inspect for damage or carbon blockage.

⚠ WARNING Exhaust heat/gases could ignite combustibles or structures resulting in death, serious injury and/or property damage. Contact with muffler area could cause burns resulting in serious injury.

- DO NOT touch hot parts and AVOID hot exhaust gases.
- Allow equipment to cool before touching.
- DO NOT install the generator closer than 5 feet (1.5m) from any combustibles or structures with combustible walls having a fire resistance rating of less than 1 hour.
- Keep at least minimum distances shown in *General Location Guidelines* to insure for proper generator cooling and maintenance clearances.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws.
Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.
- Replacement parts must be the same and installed in the same position as the original parts.

Clean and inspect the spark arrester as follows:

1. To remove muffler guard, remove four screws that connects guard to generator (Figure 11).

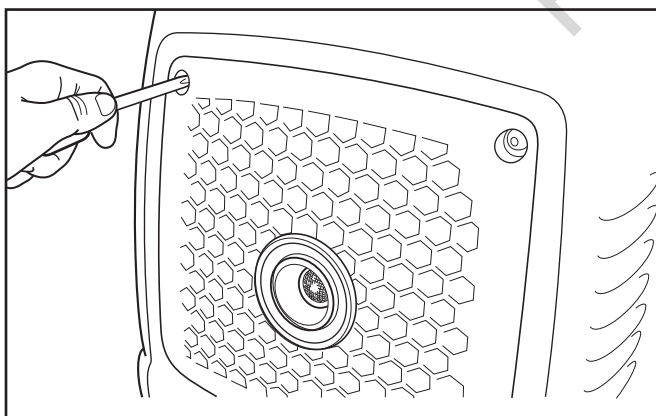


Figure 11

2. Remove screw (Figure 12) that attaches spark arrester screen muffler. Remove spark arrester screen.

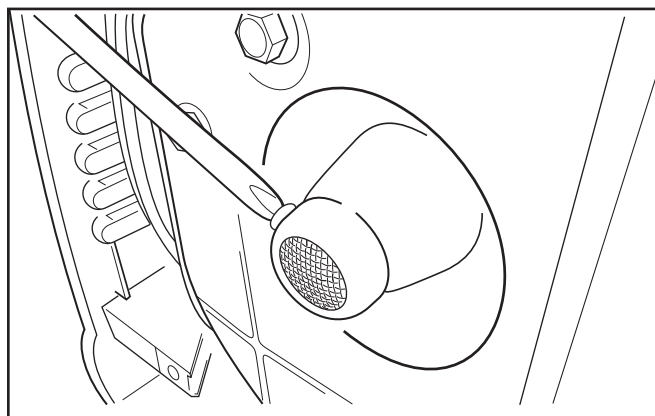


Figure 12

3. Inspect screen and obtain a replacement if torn, perforated, or otherwise damaged. DO NOT use a defective screen. If screen is not damaged, clean it with a brush.
4. Reattach screen to muffler. Reattach muffler guard.

Adjust Valve Clearance

NOTE: Check valve clearance while the engine is cold.

1. Turn crankshaft counterclockwise until piston is at top dead center on the compression stroke. This prevents the compression release from holding the valves open.
2. Insert a narrow screwdriver or rod into the spark plug as a gauge, then slowly turn crankshaft counterclockwise until the piston has moved down the bore by 1/4" (6 mm).
3. Using feeler gauge, check valve clearance. Clearance should be as listed in Specifications.
4. If not, adjust jam nut until correct clearance is obtained.

Rewind Starter Replacement

Disassemble Rewind Starter

1. Remove control panel, inverter, and fuel tank as described in the *Troubleshooting* section.
2. Locate the rewind starter handle (A, Figure 13) and remove the screw that is located under the handle.



Figure 13

3. Push the handle assembly through the generator enclosure (Figure 14).



Figure 14

4. Pull out rope from rewind starter as far as it will go. Then allow rope to retract slightly until the hole in the pulley and eyelet in the housing are lined up. Securely clamp the pulley and housing together to prevent the pulley from spinning.
5. Pull the rope knot out of the pulley. Untie the knot and then slip rope out of the rewind starter. Remove insert from rope handle. Untie knot and slip insert and handle from rope.
6. Carefully release the clamp on the starter and allow the pulley to slowly unwind until it stops.
7. Remove shoulder screw and retainer plate from pulley. Lift out pawls and pawl springs.
8. Rotate pulley until rewind springs is disengaged from anchor tabs in the starter housing. Carefully lift out pulley with spring. DO NOT remove the spring from the pulley.

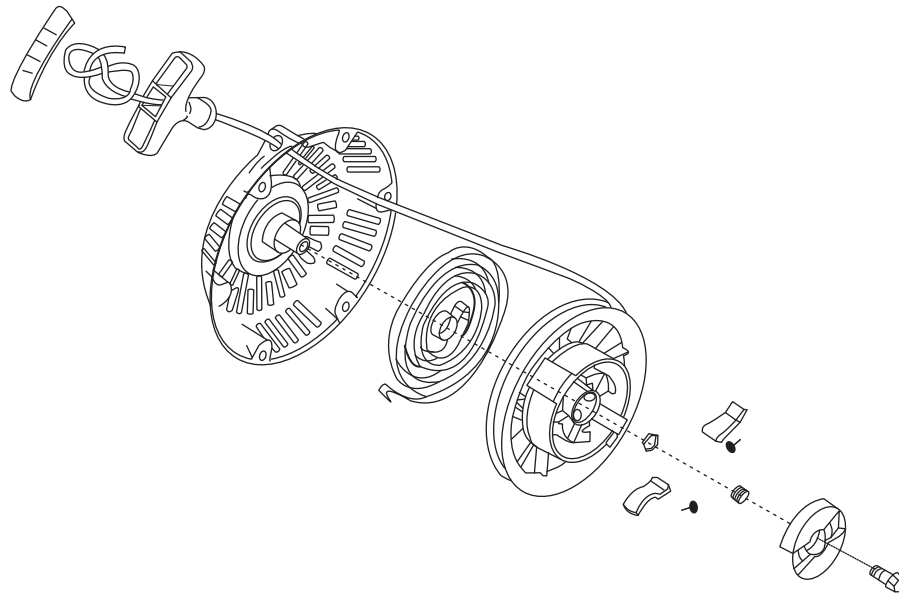


Figure 15

Inspect Rewind Starter Parts

1. Inspect the pulley for wear, cracks, rough edges, or burrs in the rope groove and look for wear in the center hole. If wear or damage is found, replace the pulley and spring assembly.
2. Inspect the spring for broken ends, kinks, or burrs. If damage is found, replace the pulley and spring assembly.
3. Inspect the starter housing for wear or burrs at the rope eyelet, the center pivot post, and the anchor tab. If damage is found, replace the housing.
4. Inspect the drive pawls for wear at the tips or pivot points. Replace pawls if worn.
5. Inspect the rope for broken or frayed areas. Replace rope if necessary.

Assemble Rewind Starter

1. Install pulley and spring assembly into starter housing. Rotate pulley clockwise until slight resistance is felt, which indicates that the spring has engaged in the anchor tab.
2. Install pawl springs and pawls. Position retainer plate on pulley. Ensure that the slots in the retainer fit over the tabs in the pulley, then install shoulder screw. Torque screw to 30 in. lb. (3 Nm).
3. While holding retainer, rotate the pulley to extend and retract the pawls. If they do not move properly, remove and reinstall the retainer plate.
4. Turn pulley clockwise until the spring is wound tight. Then allow the pulley to unwind slightly until the hole in the pulley and the eyelet in the housing are lined up. Securely clamp the pulley and housing together to prevent the pulley from spinning.
5. Insert one end of starter rope through the eyelet and then through hole in pulley. Tie an overhand knot in the end of rope, then pull rope until knot is seated in pulley, Trim excess rope if necessary.
6. Slip other end of rope through handle and insert. Tie a knot in end of rope, then pull rope until knot is seated in the insert. Trim excess rope if necessary.
7. Quickly burn each end of the rope with an open flame to prevent swelling and fraying of the weave. Then press the handle insert into the rope handle.
8. Carefully release the clamp on the starter and allow the pulley to slowly unwind until the rope is retracted. Smoothly pull the rope handle several times to ensure proper operation of the starter assembly.

Troubleshooting

Fuel System

Fuel Pump

The fuel pump (A, Figure 16) is located on inside of cover. It is operated by vacuum pulses from the engine. The fuel pump is not serviceable. If the pump does not operate after inspection, replace the pump.

Inspect pump for:

- Ensure vacuum hose is connected properly
- Restrictions or leaks in vacuum or fuel hoses
- Cracks or distortion in pump body or base

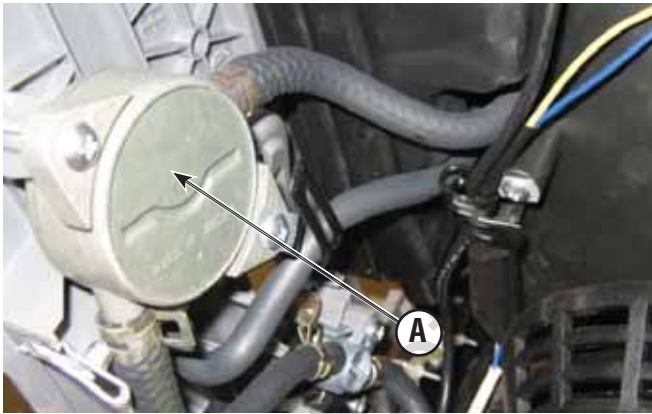


Figure 16

Fuel Tank

The fuel tank is metal (A, Figure 17) and is not repairable.

Inspect tank for:

- Corrosion
- Leaks

If leaks or other damage are found, replace the tank.

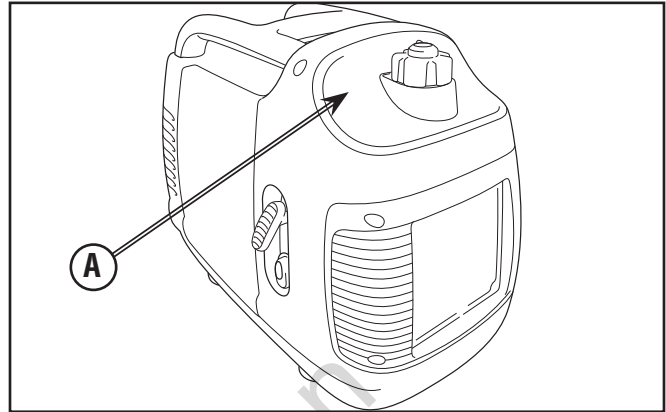


Figure 17

Fuel Hoses

Inspect hoses for:

- Blockage
- Kinks
- Brittleness
- Tears
- Bulges

If any damage is found, replace the hoses (Figure 18).



Figure 18

Fuel Valve

The fuel valve is mounted behind the side maintenance cover.

Check the valve for proper operation as follows:

1. Using small, flat-head screwdriver, pry off cover to the fuel valve knob (Figure 19).



Figure 19

2. Remove screw under the cover to remove the knob (B, Figure 20).



Figure 20

3. Check the fuel valve for leaks (C, Figure 21).



Figure 21

If the fuel valve leaks, it must be replaced as follows:

1. Loosen four screws (Figure 22) on the control panel.



Figure 22

2. Remove control panel from enclosure and, without disconnecting wiring, set control panel aside (**D**, Figure 23).
3. Remove inverter from enclosure (**E**) and, without disconnecting wiring, set inverter assembly aside.

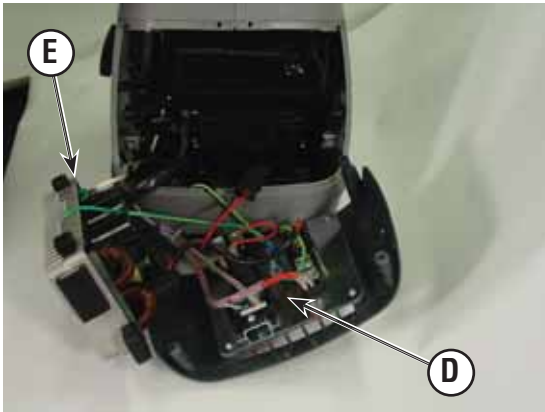


Figure 23

4. Close vent on fuel cap. Carefully spread ends of generator housing to remove fuel tank (Figure 24) from unit. Set fuel tank aside.



Figure 24

5. Locate fuel valve (**F**, Figure 25) inside of the generator enclosure.
6. Remove hoses (**G**) and loosen screw (**H**) to remove the fuel valve.
7. Install a new fuel valve using the above steps in reverse order.

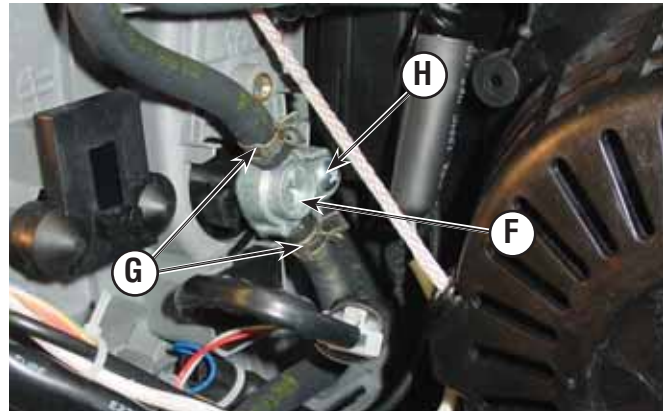


Figure 25

Fuel Filter

The fuel filter is located inside the fuel tank (See Figure 18) and can be accessed by removing fuel hose. If fuel is not flowing properly, remove the filter and clean it with carb cleaner or other appropriate cleaner.

If fuel will not flow after cleaning, replace the filter.

Carburetor

Inspect carburetor for:

- Blockage
- Leaks
- Varnish or Gummy Residue

If carburetor is suspected to have a fuel leak or blockage, follow these steps:

1. Loosen the two self-locking screws and remove the side maintenance cover (Figure 26) and set aside. This will expose the air filter and carburetor assemblies.



Figure 26

2. Inspect carburetor fuel drain hose (A, Figure 27). If there is a leak, check to make sure the drain screw (B) is tight and secured correctly.

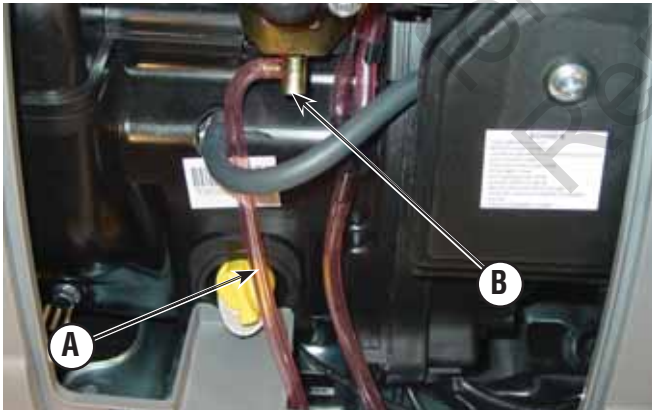


Figure 27

3. Remove screw from air filter cover (Figure 28). Set cover aside.



Figure 28

4. Remove breather filter (B, Figure 29) to expose the air cleaner assembly screw. Loosen and remove screws (C) to remove air cleaner assembly.

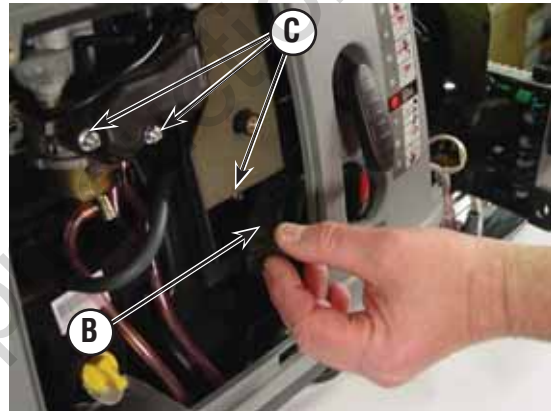


Figure 29

5. Remove air cleaner assembly and set aside (Figure 30).



Figure 30

6. Inspect carburetor overload hose (D, Figure 31). If there is fuel leaking from this hose, the fuel inlet could be blocked and will require cleaning.



Figure 31

7. Remove the hose that is connected to carburetor assembly (Figure 32).



Figure 32

8. While leaving the stepper motor attached, carefully slide carburetor assembly off engine.

9. Remove bowl nut (Figure 33) and the fuel bowl. Check for damage, leaks, and gummy residue.



Figure 33

10. Remove the float hinge pin (Figure 34).



Figure 34

11. Ensure the inlet needle and spring (A) are assembled correctly, with the spring located below the float bosses (Figure 35).

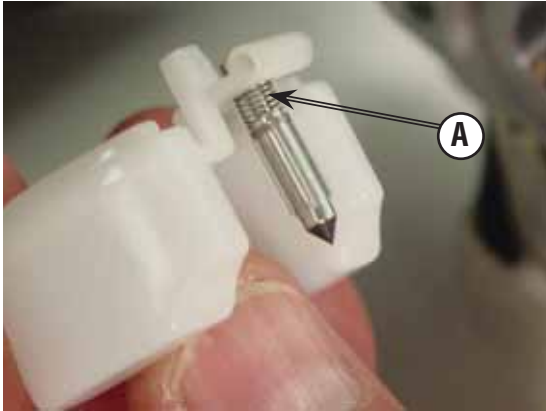


Figure 35

12. Using a carburetor nozzle screwdriver, remove the main jet and emulsion tube (Figure 36). Clean as needed.
13. Using carburetor cleaner, thoroughly clean the following components, then follow with compressed air to dry:
 - Passages in the main jet
 - Inside and outside of the fuel bowl
 - Float

If any passages remain plugged after cleaning, replace the entire carburetor assembly.



Figure 36

14. Inspect openings in the carburetor body for blockage. Inspect throttle and choke shafts for wear or damage. If found, replace the entire carburetor assembly.
15. Inspect all valves, openings, and o-rings for damage or wear. If damage is found, replace the carburetor.
16. Assemble carburetor using steps 8 through 12 in reverse order.

Stepper Motor

The stepper motor (electric throttle actuator) responds to the inverter module to continuously match engine speed to the power needs of the generator.

The stepper motor (Figure 37) is attached to the top of the carburetor assembly.



Figure 37

Before removing the motor assembly, first check the resistance of the motor lead wires.

1. Disconnect wires from inverter and locate the connector (A, Figure 38).

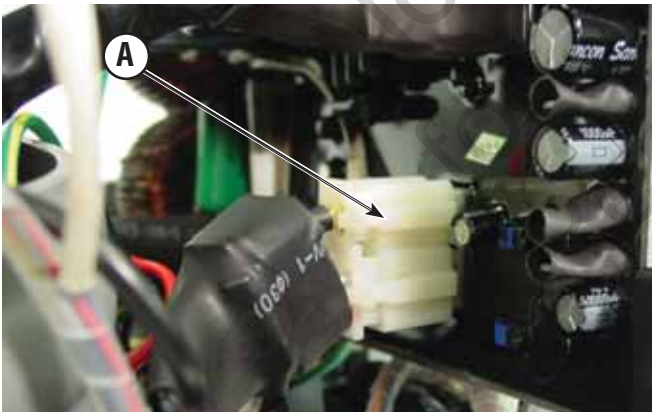


Figure 38

2. Measure the resistance across wires (B, Figure 39).
3. Measure the resistance across wires (C, Figure 39).
4. Resistance should measure between 45 - 55 Ω .
5. If the resistance measured is outside of this specified range, replace the stepper motor.

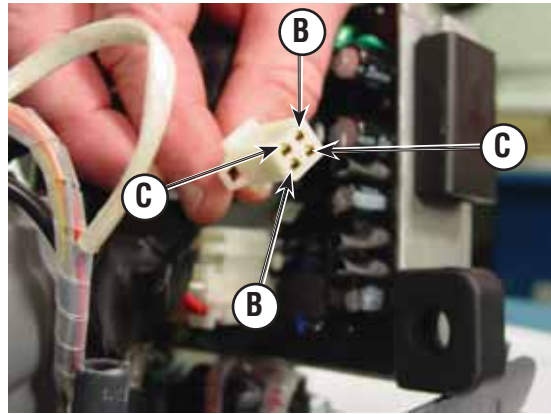


Figure 39

Some instances of stepper motor malfunction can be traced to sticking linkages.

To access the linkage, remove the stepper motor as follows:

1. Release the locking tabs (D, Figure 40) to remove the stepper motor cover (E). Set cover aside.

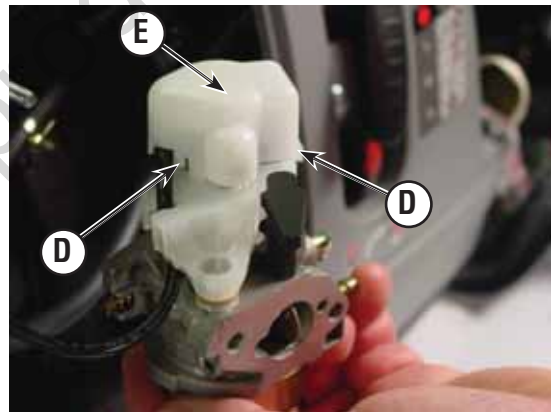


Figure 40

2. Remove two screws that hold the stepper motor to the carburetor assembly (F, Figure 41).
3. Locate the throttle lever (G).

NOTE: When removing the stepper motor from the carburetor assembly, the spring (H) may become disengaged. Ensure that the spring does not become lost.

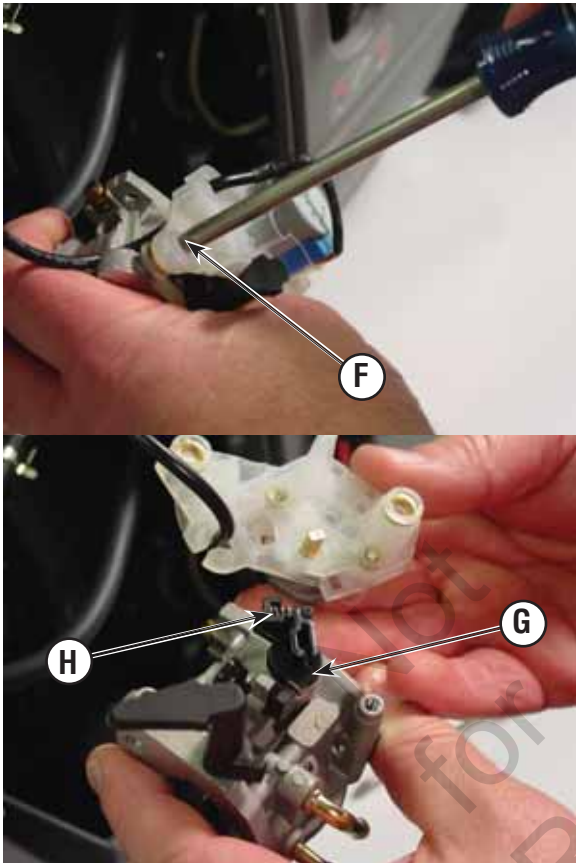


Figure 41

4. Actuate the throttle lever to check for proper movement (Figure 42). The lever should move freely in both directions.
5. If the linkages stick, spray lubricant on the lever and manually move the lever. This should free the linkages. If not, replace the carburetor.

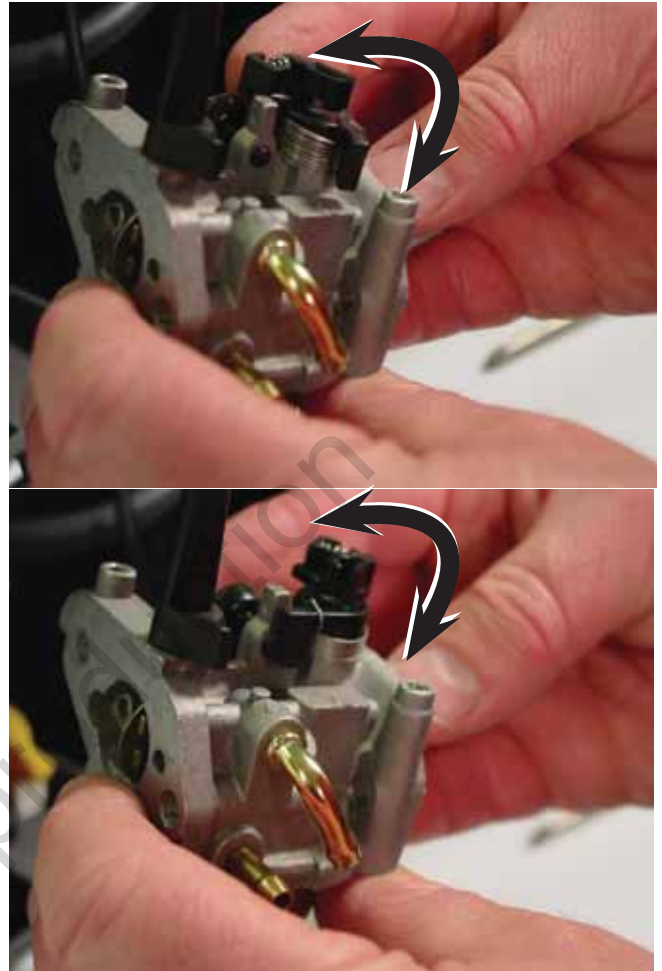


Figure 42

Engine Will Not Start

The Engine Cranks But Has No Spark

If the engine cranks but has no spark, it could be the micro switch (A, Figure 43).



Figure 43

Test the continuity of the microswitch as follows:

1. Remove the control panel.
2. Disconnect the 10-pin connector (Figure 44) that is connected to the ignition module (module with three LED lights).



Figure 44

3. Turn the microswitch on and test between the terminal (A, Figure 45) and ground.

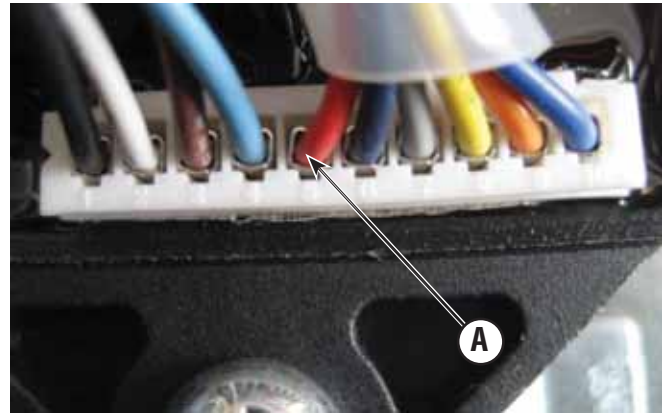


Figure 45

- When the switch is in the ON position, no continuity should be measured.
 - When the switch is in the OFF position, continuity should be measured.
4. If there is no continuity at the 10-pin connector, test at the switch. If the microswitch is pressed down (Figure 46) there should be continuity. If not, replace the switch.

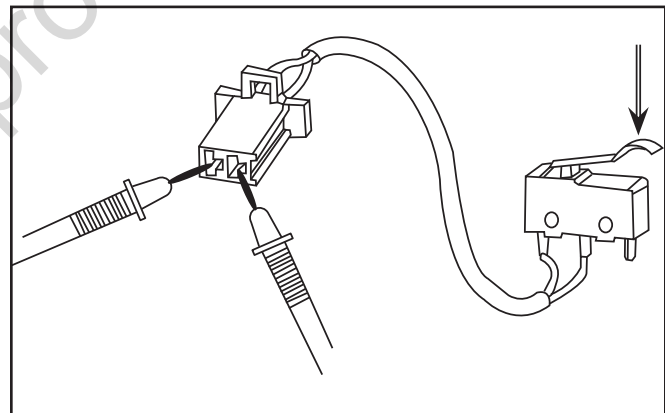


Figure 46

Spark Plug

See *Engine Maintenance*.

Low Oil Switch

The low oil indicator system is designed to prevent engine damage caused from insufficient engine oil. If the engine oil level drops below a preset level, the yellow LED low oil indicator light (Figure 47) illuminates and an oil switch will stop the engine.

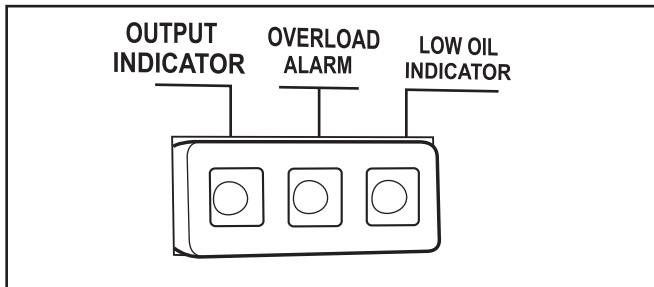


Figure 47

If the engine will not start and the low oil indicator is illuminating, proceed as follows:

1. Check the oil level in the generator. If level is acceptable, proceed to Step 2.
2. It is possible that the oil indicator float is stuck. Gently rock the generator in a side-to-side motion to free the float.
3. If oil level is correct and the float is not stuck, remove the control panel and disconnect the 10-pin connector (Figure 48).

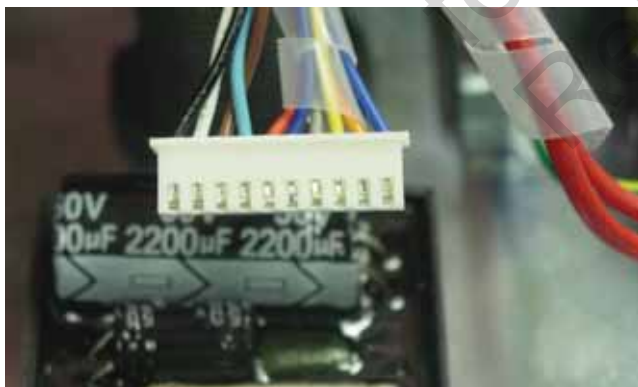


Figure 48

4. Test for continuity between ground and the low oil switch (A, Figure 49).
 - If continuity is not measured, the switch is good.
 - If continuity is measured and the oil level is good, either the switch or the wiring is defective. Repair the wiring or replace the switch.

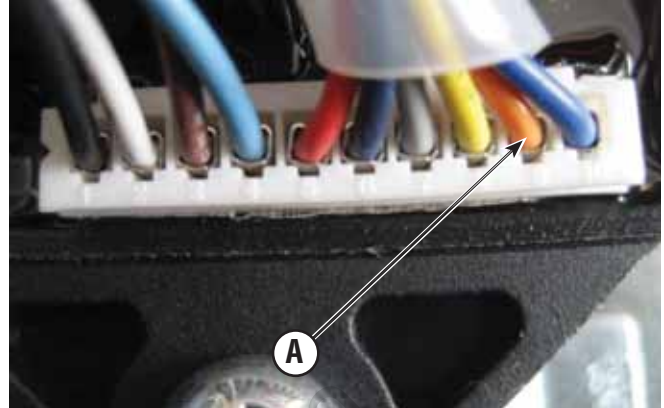


Figure 49

Ignition Spark Circuit

When the engine is running the 27V coil produces a voltage that is present at the ignition module. When the magnet on the flywheel (rotor) passes by the trigger coil, this trigger voltage is sensed by the ignition module. When the ignition module senses this trigger voltage, the module sends the voltage from the 27V coil in a pulse to the ignition coil. The ignition coil then creates a spark at the spark plug.



Figure 50

Ignition Winding

1. Remove the control panel.
2. Disconnect the 10-pin connector (Figure 50).
3. Check continuity between ground and the ignition winding (A, Figure 51).

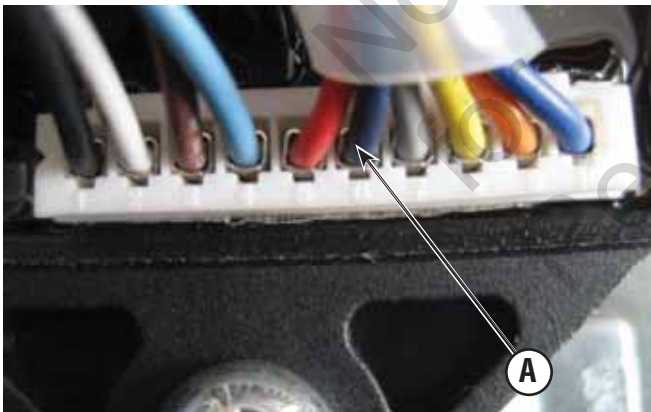


Figure 51

- If continuity is measured, the winding is good.
- If continuity is not measured, check connections and retest. If there is still no continuity measured, replace the wires.

4. Disconnect ignition winding.
5. Measure the resistance at the terminal (A, Figure 52).

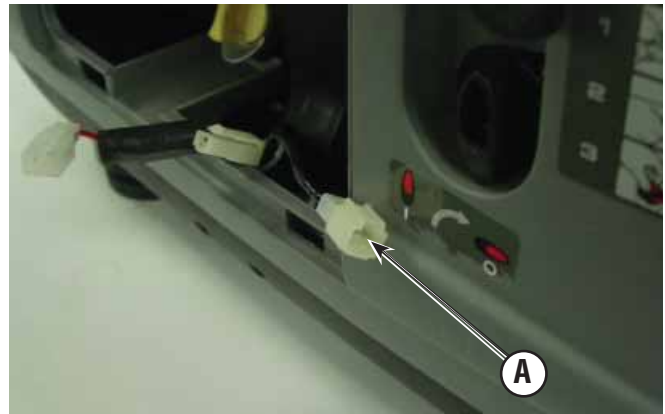


Figure 52

- If resistance is 0.40 - 0.55 Ω the coil is good.
- If resistance is not to specifications, check wire connections and retest.
- If resistance is still out of spec, replace coil.

Test Ignition Trigger Coil

1. Remove the control panel.
2. Disconnect the ten-pin connector (Figure 53).



Figure 53

3. Measure the resistance between the trigger coil (**A**, Figure 54) and ground.

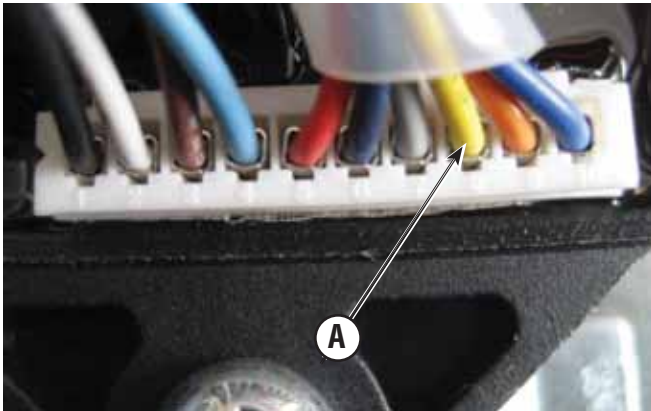


Figure 54

- If 80-130 Ω resistance is measured the coil is good.
- If resistance is not to specifications, check wire connections and retest.
- If resistance is still not to specifications, replace coil.

If resistance is still not to specifications, proceed to Step 3.

4. Disconnect ignition charge coil connection (**B**, Figure 55) and measure the resistance between the connector and ground.

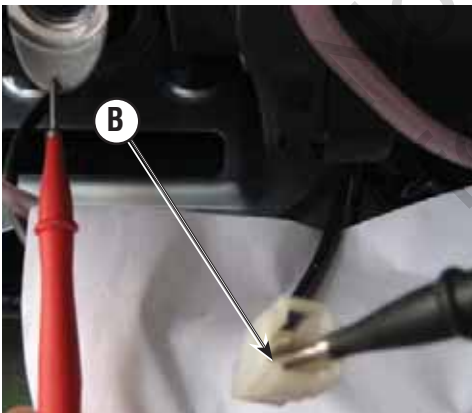


Figure 55

- If 80-130 Ω resistance is measured, the coil is good.
- If resistance is not to specifications, check wire connections and retest.
- If resistance is still not to specification, replace coil.

Test Ignition Coil

1. Locate the connector for the ignition coil (**A**, Figure 56) and disconnect..



Figure 56

2. Attach meter test leads to primary side of the ignition coil and measure the resistance (**B**, Figure 57).

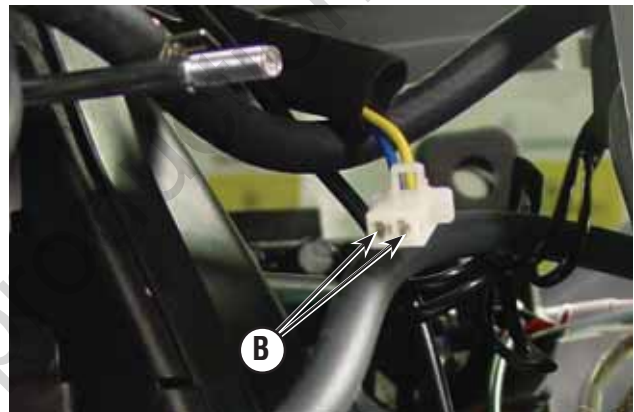


Figure 57

- If resistance is 0.8 - 1.3 Ω the primary coil is good.
- If resistance is not to specifications, check wire connections, or repair/replace wires then retest.
- If resistance is still not to specification, replace the coil.

- Attach one test lead to either terminal of ignition coil connector and the other lead to the spark plug cap (Figure 58) to measure the secondary resistance.

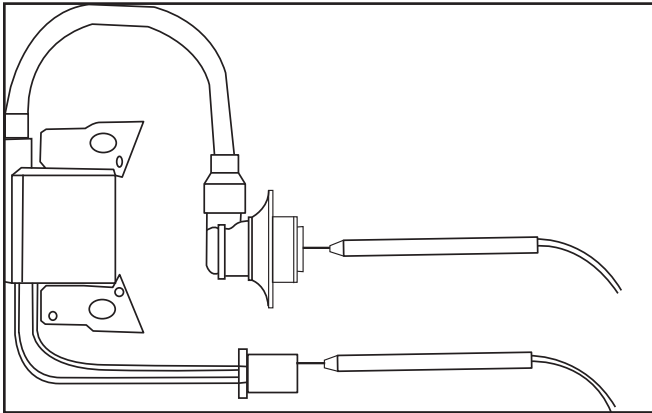


Figure 58

- If resistance is 15 - 21K Ω the coil is good.
- If resistance is not to specifications, check wire connections, or repair/replace wires then retest.
- If resistance is still not to spec, replace the coil.

Trigger Coil and Rotor Clearance

- Remove the engine shroud.
- Using the appropriate feeler gauge, measure the clearance between the trigger coil and the rotor (A, Figure 59).

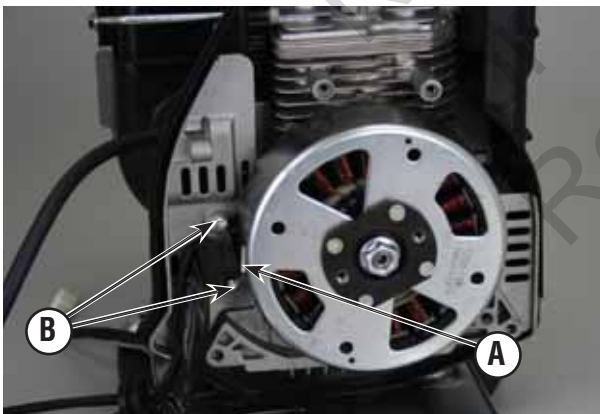


Figure 59

- The clearance should measure .021 - .03 in. (0.5 - 0.75 mm).
- If the measurement is not within specifications, loosen screws (B) and adjust until the proper measurement is attained. Tighten screws when adjustment is complete.

Ignition Module

There is no test for the ignition module. If all ignition winding tests are correct, the ignition module is faulty. Replace the ignition module.

No AC Output

- Check the output indicator (A, Figure 60). If the green LED is illuminated, check the plug connection and check for loose wires.

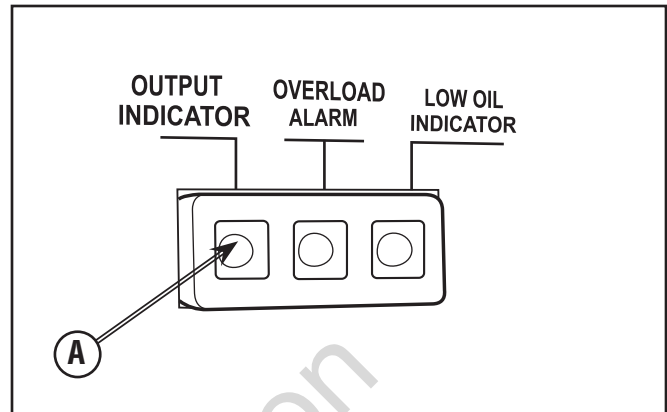


Figure 60

If there is still no AC output, proceed to Step 2.

- Check the overload alarm (B, Figure 61). If the red LED light is illuminated, and there are no loads being applied to the generator, then there is a short circuit or the inverter module is faulty. Check for loose wires from inverter to receptacle. If none are found, replace the inverter module.

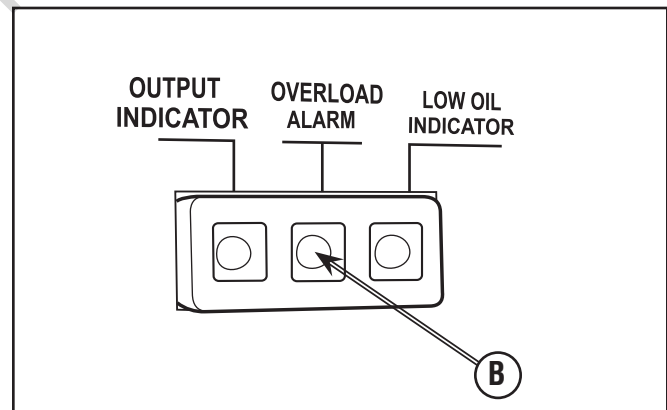


Figure 61

If there is still no AC output, proceed to Step 3.

3. Measure for 120 VAC output (C, Figure 62).



Figure 62

- If voltage is not measured, check for loose wiring.
- Repair/replace as necessary.

4. Disconnect the main winding connector and measure resistance across the windings (D, Figure 63).

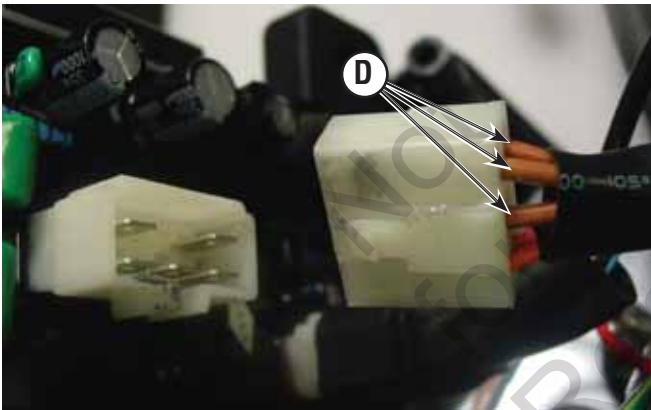


Figure 63

- If resistance is 1.35 - 1.75 Ω the windings are good.
- If resistance is not to specifications, check wire connections or repair/replace wires, then retest.
- If resistance is still not to specifications, proceed to Step 5.

5. Then measure resistance across sub-windings (E, Figure 64).

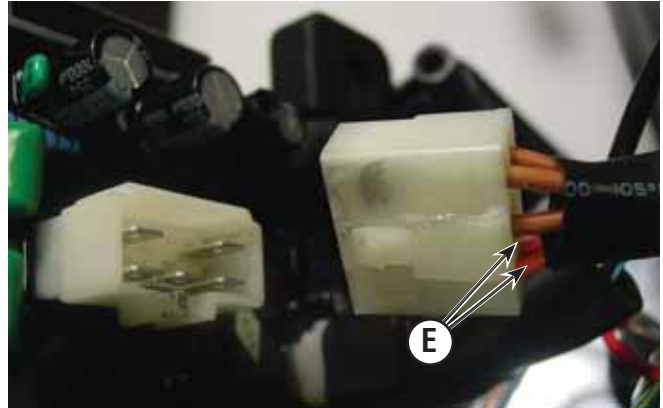


Figure 64

- If resistance is 0.15 - 0.30 Ω the windings are good.
- If resistance is not to specifications, check wire connections, or repair/replace wires, then retest.
- If resistance is still not to specifications, replace the stator winding.

No DC Output

1. Press the DC circuit breaker (A, Figure 65) and retest. If still no DC output, proceed to Step 2.

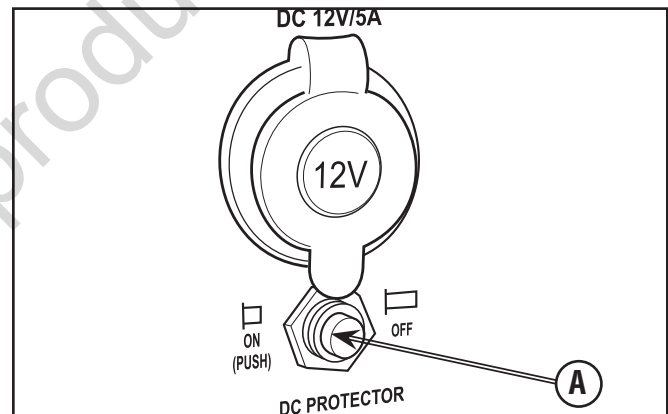


Figure 65

2. Disassemble panel cover to locate and check the wire connections (A, Figure 66).

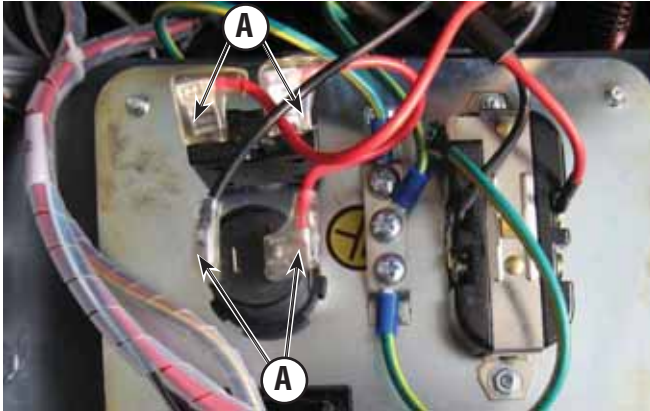


Figure 66

- Repair and/or replace any loose wire connections and retest.
- If DC output is still not measured, proceed to Step 3.

3. Locate battery winding connector (B, Figure 67) and measure resistance across the terminals (C).

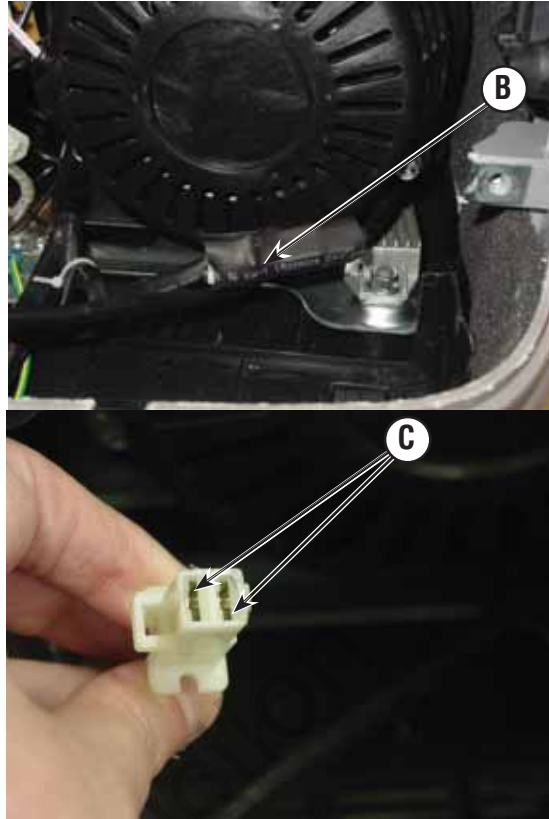


Figure 67

- If resistance is 0.3 - 0.7 Ω the winding is good.
- If resistance is not to specification, check wire connections, or repair/replace wires, then retest.
- If resistance is still not to specification, replace battery winding.

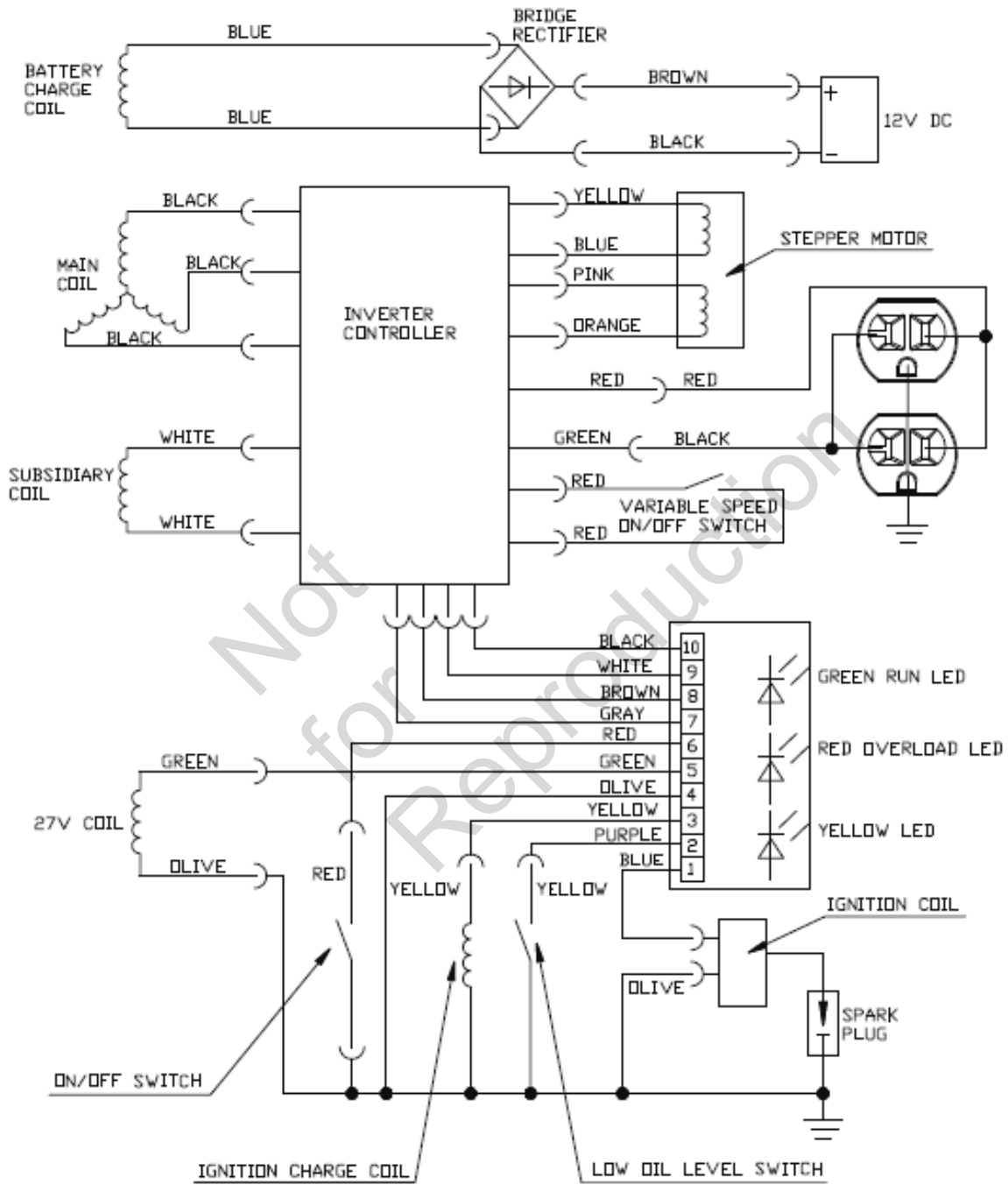
Generator Specifications

Starting Wattage	2,000 Watts
Wattage*	1,600 Watts
Load Current	
at 120 Volts AC	13.3 Amps
at 12 Volts DC	5 Amps
Rated Frequency	60 Hertz
Phase	Single Phase
Displacement	6.44 cu. in. (105.6 cc)
Spark Plug Gap	.025 in. (.65 mm)
Intake Valve Clearance	.003 - .005 in. (.08 - .13 mm) cold
Exhaust Valve Clearance	.005 - .007 in. (.13 - .18 mm) cold
Fuel Capacity	1.0 U.S. gallon (3.7 L)
Oil Capacity	13.5 Ounces (0.4 L)

*This generator is rated in accordance with CSA (Canadian Standards Association) standard C22.2 No. 100-04 (motors and generators)

RESISTANCE SPECIFICATIONS	
Power Coil Winding	1.35 - 1.75 Ohms
Subsidiary Coil Winding	0.15 - 0.30 Ohms
Battery Coil Winding	0.30 - 0.70 Ohms
Trigger Coil Winding	80 - 130 Ohms
Ignition Coil Winding	0.8 - 1.3 Ohms

Generator Wiring Diagram



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